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Grasshopper population interpolation with Generalized linear models

This study was carried up in grassland areas in Durango México. Between latitude (23.916º, 25.983º) and longitude (-104.997º, -104.010º). There were established sampling sites. At each of these sites, twice a month a grasshopper sampling was done from June to November 2003. Three were the most abundant species. The purpose of this study was to create grasshopper population maps with linear regression.

Since the assumption of normality failed for the dependent variables, the distributions Poisson, Gamma and Inverse binomial of the generalized linear models were analyzed. taking as dependent variable the number of grasshopper surveyed of each species and the independent variables were, latitude (º), longitude (º), altitude (m), slope (percentage), temperature (annual average ºC), precipitation (annual mm), landcover, type of vegetation, type of soil and vegetation index. According to the deviance criteria the best model was Gamma with logarithmic link function since the deviance 11.211 with 9 d. f. was lower than 16.91 the 95-th percentile of the chi-squared with 9 d.f. The distributions of the residuals were heterogeneous at the three grasshopper species and the lowest correlation coefficient between predicted grasshopper and observed was R^2=0.83. The generalized linear models are alternative models when the normal assumption has not been reached and when the dependent variable is a count data.